Release notes for ENDF/B Development photoat-079_Au_000 evaluation

October 13, 2016

- `checkr` Warnings:

  1. A previous error halted parsing of the current section
     MAT=7900, MF= 1, MT=451 (1): Parsing stopped

     ```
     ERROR(S) FOUND IN MAT=7900, MF= 1, MT=451
         SECTION CANNOT BE CHECKED FROM SEQUENCE NUMBER      165 TO      199
     ```

- `checkr` Errors:

  1. A variable is outside the allowed ENDF range
     MAT=7900, MF= 1, MT=451 (0): Variable range

     ```
     ERROR(S) FOUND IN MAT=7900, MF= 1, MT=451
         MOD =     3 OUT OF RANGE     0 -     1            RECORD NUMBER     165
     ```

  2. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=501 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=7900, MF=23, MT=501
         SECTION 23/501 NOT IN DIRECTORY                RECORD NUMBER     201
     ```

  3. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=502 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=7900, MF=23, MT=502
         SECTION 23/502 NOT IN DIRECTORY                RECORD NUMBER     1069
     ```

  4. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=504 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=7900, MF=23, MT=504
         SECTION 23/504 NOT IN DIRECTORY                RECORD NUMBER     1443
     ```

  5. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=515 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=7900, MF=23, MT=515
         SECTION 23/515 NOT IN DIRECTORY                RECORD NUMBER     1484
     ```

  6. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=516 (0): Directory (b)

     ```
     ERROR(S) FOUND IN MAT=7900, MF=23, MT=516
         SECTION 23/516 NOT IN DIRECTORY                RECORD NUMBER     1519
     ```

  7. Missing a section in directory so your directory is messed up. This error will break everything else
     MAT=7900, MF=23, MT=517 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=517
    SECTION 23/517 NOT IN DIRECTORY                    RECORD NUMBER    1574
```

8. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=7900, MF=23, MT=522 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=522
    SECTION 23/522 NOT IN DIRECTORY                    RECORD NUMBER    1616
```

9. Missing a section in directory so your directory is messed up. This error will break everything else
   MAT=7900, MF=23, MT=534 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=534
    SECTION 23/534 NOT IN DIRECTORY                    RECORD NUMBER    2041
```

10. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=535 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=535
    SECTION 23/535 NOT IN DIRECTORY                    RECORD NUMBER    2061
```

11. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=536 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=536
    SECTION 23/536 NOT IN DIRECTORY                    RECORD NUMBER    2084
```

12. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=537 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=537
    SECTION 23/537 NOT IN DIRECTORY                    RECORD NUMBER    2106
```

13. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=538 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=538
    SECTION 23/538 NOT IN DIRECTORY                    RECORD NUMBER    2129
```

14. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=539 (0): Directory (b)

```
ERROR(S) FOUND IN MAT=7900, MF=23, MT=539
    SECTION 23/539 NOT IN DIRECTORY                    RECORD NUMBER    2155
```

15. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=540 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=540
          SECTION 23/540 NOT IN DIRECTORY                    RECORD NUMBER    2183
```

16. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=541 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=541
          SECTION 23/541 NOT IN DIRECTORY                    RECORD NUMBER    2213
```

17. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=542 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=542
          SECTION 23/542 NOT IN DIRECTORY                    RECORD NUMBER    2245
```

18. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=543 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=543
          SECTION 23/543 NOT IN DIRECTORY                    RECORD NUMBER    2276
```

19. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=544 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=544
          SECTION 23/544 NOT IN DIRECTORY                    RECORD NUMBER    2304
```

20. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=545 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=545
          SECTION 23/545 NOT IN DIRECTORY                    RECORD NUMBER    2337
```

21. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=546 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=546
          SECTION 23/546 NOT IN DIRECTORY                    RECORD NUMBER    2370
```

22. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=547 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=23, MT=547
          SECTION 23/547 NOT IN DIRECTORY                    RECORD NUMBER    2416
```

23. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=548 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=548
          SECTION 23/548 NOT IN DIRECTORY                    RECORD NUMBER    2462
```

24. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=549 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=549
          SECTION 23/549 NOT IN DIRECTORY                    RECORD NUMBER    2521
```

25. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=550 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=550
          SECTION 23/550 NOT IN DIRECTORY                    RECORD NUMBER    2580
```

26. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=551 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=551
          SECTION 23/551 NOT IN DIRECTORY                    RECORD NUMBER    2616
```

27. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=552 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=552
          SECTION 23/552 NOT IN DIRECTORY                    RECORD NUMBER    2661
```

28. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=553 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=553
          SECTION 23/553 NOT IN DIRECTORY                    RECORD NUMBER    2704
```

29. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=554 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=554
          SECTION 23/554 NOT IN DIRECTORY                    RECORD NUMBER    2767
```

30. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=23, MT=559 (0): Directory (b)

```
      ERROR(S) FOUND IN MAT=7900, MF=23, MT=559
          SECTION 23/559 NOT IN DIRECTORY                    RECORD NUMBER    2829
```

31. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=27, MT=502 (0): Directory (b)

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```
        ERROR(S) FOUND IN MAT=7900, MF=27, MT=502
            SECTION 27/502 NOT IN DIRECTORY                    RECORD NUMBER    2873
```

32. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=27, MT=504 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=27, MT=504
            SECTION 27/504 NOT IN DIRECTORY                    RECORD NUMBER    2921
```

33. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=27, MT=505 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=27, MT=505
            SECTION 27/505 NOT IN DIRECTORY                    RECORD NUMBER    2970
```

34. Missing a section in directory so your directory is messed up. This error will break everything else
    MAT=7900, MF=27, MT=506 (0): Directory (b)

```
        ERROR(S) FOUND IN MAT=7900, MF=27, MT=506
            SECTION 27/506 NOT IN DIRECTORY                    RECORD NUMBER    3123
```

- `linear` Errors:

    1. Negative cross section found
       0: Neg. Sig(E)

    ```
        Linearize ENDF/B Cross Sections (LINEAR 2015-1)
        ------------------------------------------------------------------------
        Retrieval Criteria-----------        MAT
        Monitor Mode-----------------        Off
        Minimum Cross Section-------- 1.0000E-10 (Default Option)
    ... [73 more lines]
    ```

- `fudge-4.0` Warnings:

    1. generic warning message
       reaction label 0: Au + gamma [coherent] / Product: gamma (Error # 0): Warning

    ```
        WARNING: coherentScattering is not a valid distribution component for 2-body reaction
    ```

    2. FIXME: Generic fudge unimplemented message
       reaction label 0: Au + gamma [coherent] / Product: gamma (Error # 2): Generic unimp (c)

    ```
        WARNING: Checking not yet implemented for pointwise type data
    ```

    3. generic warning message
       reaction label 1: Au + gamma [incoherent] / Product: gamma (Error # 0): Warning

    ```
        WARNING: incoherentScattering is not a valid distribution component for 2-body reaction
    ```

4. FIXME: Generic fudge unimplemented message
reaction label 1: Au + gamma [incoherent] / Product: gamma (Error # 2): Generic unimp (c)

```
WARNING: Checking not yet implemented for piecewise type data
```

5. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
summedReaction label 26: total (Error # 0): Sumrule

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 100.00%
```

6. Cross sections do not correctly sum up properly according to an ENDF (or equivalent) sumrule
summedReaction label 28: photoelectric absorption (Error # 0): Sumrule

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 71.51%
```

- `fudge-4.0` Errors:

  1. Calculated and tabulated thresholds don't agree
  reaction label 0: Au + gamma [coherent] / Cross section: (Error # 0): Threshold mismatch

  ```
  WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
  ```

  2. 2-body reaction not in center-of-mass frame
  reaction label 0: Au + gamma [coherent] / Product: gamma (Error # 1): 2-body not in COM

  ```
  WARNING: 2-body reaction not in center-of-mass frame!
  ```

  3. Calculated and tabulated thresholds don't agree
  reaction label 1: Au + gamma [incoherent] / Cross section: (Error # 0): Threshold mismatch

  ```
  WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
  ```

  4. 2-body reaction not in center-of-mass frame
  reaction label 1: Au + gamma [incoherent] / Product: gamma (Error # 1): 2-body not in COM

  ```
  WARNING: 2-body reaction not in center-of-mass frame!
  ```

  5. Energy range of data set does not match cross section range
  reaction label 1: Au + gamma [incoherent] / Product: gamma / Distribution incoherentScattering - piecewise: (Error # 0): Domain mismatch (a)

  ```
  WARNING: Domain doesn't match the cross section domain: (0.0 -> 1000000000.0) vs (1.0 -> 1e+11)
  ```

  6. Calculated and tabulated thresholds don't agree
  reaction label 2: e- + e+ + Au [electron field] / Cross section: (Error # 0): Threshold mismatch

  ```
  WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2.044e6 eV!
  ```

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7. Calculated and tabulated thresholds don't agree
reaction label 3: e- + e+ + Au [nuclear field] / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
   ```

8. Calculated and tabulated thresholds don't agree
reaction label 4: e- + Au1s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 80960. eV!
   ```

9. Calculated and tabulated thresholds don't agree
reaction label 5: e- + Au2s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 14336. eV!
   ```

10. Calculated and tabulated thresholds don't agree
reaction label 6: e- + Au2p1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 13776. eV!
   ```

11. Calculated and tabulated thresholds don't agree
reaction label 7: e- + Au2p3/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 11922. eV!
   ```

12. Calculated and tabulated thresholds don't agree
reaction label 8: e- + Au3s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3401.4 eV!
   ```

13. Calculated and tabulated thresholds don't agree
reaction label 9: e- + Au3p1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 3144.3 eV!
   ```

14. Calculated and tabulated thresholds don't agree
reaction label 10: e- + Au3p3/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2734. eV!
   ```

15. Calculated and tabulated thresholds don't agree
reaction label 11: e- + Au3d3/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2300.7 eV!
   ```

16. Calculated and tabulated thresholds don't agree
reaction label 12: e- + Au3d5/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 2212.2 eV!
   ```

17. Calculated and tabulated thresholds don't agree
reaction label 13: e- + Au4s1/2 / Cross section: (Error # 0): Threshold mismatch

   ```
   WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 747.4 eV!
   ```

18. Calculated and tabulated thresholds don't agree
reaction label 14: e- + Au4p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 636.28 eV!
    ```

19. Calculated and tabulated thresholds don't agree
reaction label 15: e- + Au4p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 537.39 eV!
    ```

20. Calculated and tabulated thresholds don't agree
reaction label 16: e- + Au4d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 353.48 eV!
    ```

21. Calculated and tabulated thresholds don't agree
reaction label 17: e- + Au4d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 335.05 eV!
    ```

22. Calculated and tabulated thresholds don't agree
reaction label 18: e- + Au4f5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 97.37 eV!
    ```

23. Calculated and tabulated thresholds don't agree
reaction label 19: e- + Au4f7/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 93.39 eV!
    ```

24. Calculated and tabulated thresholds don't agree
reaction label 20: e- + Au5s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 115.23 eV!
    ```

25. Calculated and tabulated thresholds don't agree
reaction label 21: e- + Au5p1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 78.55 eV!
    ```

26. Calculated and tabulated thresholds don't agree
reaction label 22: e- + Au5p3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 61.37 eV!
    ```

27. Calculated and tabulated thresholds don't agree
reaction label 23: e- + Au5d3/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 12.16 eV!
    ```

28. Calculated and tabulated thresholds don't agree
reaction label 24: e- + Au5d5/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 10.46 eV!
    ```

29. Calculated and tabulated thresholds don't agree
    reaction label 25: e- + Au6s1/2 / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 8.300000000000001 eV!
    ```

30. Calculated and tabulated thresholds don't agree
    summedReaction label 26: total / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1. eV!
    ```

31. Calculated and tabulated thresholds don't agree
    summedReaction label 27: pair product / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 1.022e6 eV!
    ```

32. Calculated and tabulated thresholds don't agree
    summedReaction label 28: photoelectric absorption / Cross section: (Error # 0): Threshold mismatch

    ```
    WARNING: Calculated and tabulated thresholds disagree: 1.e-5 eV vs 8.300000000000001 eV!
    ```

- `xsectplotter` Warnings:

    1. Encountered runtime warning in xsectplotter or Fudge or matplotlib
       Error: RuntimeWarning

       ```
       stderr while processing crossSection

       /usr/local/lib/python2.7/site-packages/matplotlib-1.3.1-py2.7-linux-x86_64.egg/matplotlib/pyplot.py:412: Runtime
       ... [3 more lines]
       ```